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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/731,060	12/07/2000	Edward Colles Nevill	550-192	1332

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EXAMINER

NGUYEN, ANH T

ART UNIT	PAPER NUMBER
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2127

DATE MAILED: 01/20/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/731,060

Applicant(s)

NEVILL ET AL.

Examiner

Anh T Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6 . 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-16 are presented for examination.

Information Disclosure Statement

2. To insure proper consideration and to the extent required by 37 CFR 1.56, applicant is required to supply a copy of the publication reference cited in the specification because it is not readily available to the examiner(see page 3, lines 17-25).

The following references are requested:

IBM Technical Disclosure Bulletin, March 1972, pp3074-3076, "Op Code and Status Handling For Emulation"; IBM Technical Disclosure Bulletin, August 1982, pp954-956, "On-Chip Microcoding of a Microprocessor With Most Frequently Used Instructions of Large System and Primitives Suitable for Coding Remaining Instructions"; the book ARM System Architecture by S Furber; the book Computer Architecture: A Quantitative Approach by Hennessy and Patterson; and the book The Java Virtual Machine Specification by Tim Lindholm and Frank Yellin 1st and 2nd Editions.

Drawings

3. The drawings filed on 2/28/01 are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "64" and "68" have both been used to designate "java bytecode translation". A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid

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abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The abstract of the disclosure is objected to because reference characters "68" and "86" have both been used to designate "hardware translation unit".

Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because it is replete with grammatical errors:

Page 4, line 16, "deal" should recite --dealt--.

Page 10, line 32, "very" should recite --vary--.

Page 11, line 43, "currently" should recite --current--.

Page 27, line 9, "determined" should recite --determine--.

Appropriate corrections are required.

Applicant should revise the entire specification.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 11-13 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCrory (USPN 6,513,057) and Belhaj (USPN 6,564,179).

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7. As per claim 1, McCrory teaches the invention substantially as claimed including an apparatus for processing program instructions comprising:

a hardware based instruction execution unit(col.4, line 9, FIG.1, processors) wherein program instructions to be executed are sent(col.4, line 30, A processor executes code). McCrory teaches the use of multi-processors (hardware) wherein the operating system determines and schedules which processors to associate with which instructions(col.4, line 24-25), thereby supporting mixed mode instruction stream(see Abstract). McCrory also teaches the control being returned to hardware based execution unit for a next program instruction to be executed (Abstract, return thread to processor in order to support mixed mode instruction stream subroutine).

8. McCrory does not teach a software based instruction execution unit for which program instructions are to be sent if not supported by hardware based execution unit.

9. Belhaj teaches a software based instruction execution unit (emulation module, see Abstract) operable to execute program instructions which are not supported by the hardware execution unit.

10. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of McCrory and Belhaj because they are from the same field of endeavor of processors.

11. The motivation for doing so would have been because combining McCrory's mixed mode execution of instructions with Belhaj's software emulator, a programmer can take advantage of strengths or particular capabilities of different processors within a single application program (McCrory, col.2 lines 60-63) and programmers will program

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efficiently and generate code easily with minimum size requirements (Belhaj, col.2, lines 16-21).

12. As per claim 11, Belhaj discloses a processor core operable to execute operations as specified by instructions of a first instruction set (i.e. host processor, DSP) (col.2, lines 30-31).

13. As per claim 12, Belhaj discloses a hardware based instruction execution unit (host processor, col.2, line 26) that includes an instruction translator (emulation module, col.2, line 26) operable to translate instructions of a second instruction set (i.e. non-native) into translator output signals corresponding to instructions of said first instruction set (i.e. native).

14. As per claim 13, the combination of McCrory and Belhaj discloses an apparatus wherein at least one instruction of second instruction set (i.e. non-native instruction set) specifies a multi-step operation that requires a plurality of operations that may be specified by instructions of first instruction set in order to be performed by processor core (i.e. host processor). It is inherent that in order for the non-native instructions to be executed, the instructions must be translated (as specified by the native instructions) by the emulator and then executed by the host processor. This will require the translator to generate a sequence of translator output signals to cause the host processor to perform the multi-step operation of translating non-native instructions to native instructions and then executing them.

15. As per claim 14, Belhaj discloses the software-base emulation module (col.4, lines 5-6).

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16. As per claim 15, the combination of McCrory and Belhaj teaches the apparatus as claimed. However, McCrory and Belhaj do not teach that the program instructions are Java Virtual Machine instructions. Accordingly, it would have been obvious for one skilled in the art at the time the invention was made to implement the apparatus as claimed using Java Virtual Machine because an advantage of utilizing virtual machine instructions is that flexibility is achieved since the virtual machine instructions may be run, unmodified, on any computer system that has a virtual machine implementation, making for a truly portable language. Additionally, other programming languages may be compiled into Java virtual machine instructions and executed by a Java virtual machine

17. Claim 16 is directed to a method of processing data by executing instructions as set forth in claim 1, therefor claim 16 is rejected for the same reasons set forth hereinabove.

18. Claims 2-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCrory (USPN 6,513,057) and Belhaj (USPN 6,564,179) in view of applicant's admitted prior art.

The combination of McCrory and Belhaj discloses the apparatus as claimed in Claim1. Claims 2-6 which are dependent on claim 1 are directed to a counter that triggers generation of scheduling signal. Applicant states that it is known to control processing operations using a counter base approach whereby program instructions being executed are counted and a scheduling operation initiated each time a predetermined program instruction count level is reached (page2, lines 12-15).

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As per claim 7, McCrory and Belhaj did not specifically teach the debug operation. However, it would have been obvious to one of ordinary skill in the art to have included the debug operation in McCrory and Belhaj's system because doing so would improve the integrity of their system by having the capability of debugging if fault happened.

Claims 8-10, which are dependent on claim 1, are directed to timer based scheduling wherein a scheduling signal is combined with a timer signal to trigger scheduling. (Page2, lines 15-17).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh T Nguyen whose telephone number is (703) 305-8649. The examiner can normally be reached on Monday-Friday from 7:00am-4:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An, can be reached on (703) 305-9678. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-5484.

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Anh T. Nguyen
Art Unit 2127
January 12, 2004



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SUPERVISORY PATENT EXAMINER
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